

ABSTRACT

A gas compressor based on the use of a driven rotor having a compression ramp traveling at a local supersonic inlet velocity (based on the combination of inlet gas velocity and tangential speed of the ramp) which
5 compresses inlet gas against a stationary sidewall. In using this method to compress inlet gas, the supersonic compressor efficiently achieves high compression ratios while utilizing a compact, stabilized gasdynamic flow path. Operated at supersonic speeds, the inlet stabilizes an oblique/normal shock system in the gasdynamic flow path formed between the rim of the rotor, the
10 strakes, and a stationary external housing. Part load efficiency is enhanced by the use of a pre-swirl compressor, and using a bypass stream to bleed a portion of the intermediate pressure gas after passing through the pre-swirl compressor back to the inlet of the pre-swirl compressor. Inlet guide vanes to the compression ramp enhance overall efficiency.

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